

U.S. Patent Application Serial No. **10/589,439**  
Response filed May 13, 2010  
Reply to OA dated March 30, 2010

**REMARKS**

Claims 1-9 are pending in this application. No amendment is made in this Response. It is believed that this Response is fully responsive to the Office Action dated March 30, 2010.

**Claim 8 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.** (Office action page 2)

The rejection of claim 8 is respectfully traversed, and reconsideration is requested.

The Examiner states: "The term 'aggregating and aggregation' in claim 8 is a relative term which renders the claim indefinite. ..." The Examiner apparently refers here to the phrases "formed by mutually aggregating" and "by means of aggregation" in claim 8.

The Examiner further states: "Aggregate has more than one meaning. It can mean constituting or amounting to a whole, and composed of a mixture of minerals separable by mechanical means."

However, the Examiner here refers to definitions for "aggregate" as an **adjective**.

In claim 8, a form of the word "aggregate" first appears as a **verb** in the product-by-process phrase "formed by mutually aggregating." The definitions of "aggregate" as a **verb** are: 1. to collect or gather into a mass or whole; 2. to amount in the aggregate to (*Webster's Ninth New Collegiate Dictionary*, Merriam-Webster Inc., Springfield, Massachusetts, 1984, p. 64). From the context of claim 1, the term is clearly being used in the sense of definition 1. (Definition 2 is not an actual

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process that can be performed). That is, in claim 8, the organic-inorganic nanofibers are collected or gathered into a mass.

The second occurrence of the term in claim 8, “by means of aggregation,” uses the **noun** “aggregation.” The dictionary definitions of aggregation (noun) are: 1. a group, body, or mass, composed of many distinct parts or individuals; 2a. The collecting of units or parts into a mass or whole; 2b. The condition of being so collected. Grammatically, it is clear that “aggregation” is being used in the sense of definition 2a.

Applicant therefore submits that the dictionary definitions pointed out by the Examiner are irrelevant because they refer only to the word “aggregate” as an adjective, and “aggregate” as an adjective does not appear in claim 8. Applicant submits that the use of “aggregating” (verb) and the use of “aggregation”(noun) in claim 8 are clear in view of the dictionary definitions of these terms.

The Examiner also states that the specification does not provide guidance as to how the terms should be interpreted. However, the specification at page 18, lines 7 and ff., states that “crystal polymer filaments are **mutually aggregated** in the presence of water, and form a three-dimensional form ....” Page 18, lines 13-15, also discloses: “the crystalline polymer filaments in the aggregate are further physically aggregated to form a crosslinked structure ...” The specification uses “aggregate” as a noun as well as a verb. The specification therefore does give guidance as to the meaning of “mutually aggregated,” that is, forming a three-dimensional form from individual filaments, and the use of the terms in the specification is completely consistent with the dictionary definitions.

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**Claims 1-9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Smith WO 01/27368 and further in view of Sakai et al. (US 5,750,258). (Office action page 3)**

The rejection of claims 1-9 is respectfully traversed and reconsideration is requested.

With regard to claim 1, the Examiner cites Smith for disclosing an organic-inorganic hybrid nanofiber, where the nanofibers are crystalline polymer filaments made of a polymer having a straight chain polyethyleneimine skeleton. The Examiner states that Smith does not disclose silica covering the crystalline polymer filament.

The Examiner cites Sakai et al. for disclosing a crosslinked resin-coated silica fine particle using a vinyl silane coupling agent, where the coupling agent is made of a silane portion while using polyethyleneimine as a dispersion stabilizer. The Examiner states that it would have been obvious to modify Smith using a silica covering in order to control the thickness of the polymer filament, in order to improve the hardness and strength of the material being coated.

In traversing the rejection, Applicant notes that Smith discloses fibers that can react chemically with chemical warfare agents, and are suitable for making a fabric for protection against these chemical agents. Smith discloses fibers ranging from 100 nm to 1 micron in diameter, produced by electrospinning techniques from alcohol solution, and which are generally linear poly(ethyleneimine)s.

The rejection is based on “modifying Smith using silica covering ....” (Office action, page 4, lines 1-2). However, the Examiner does not clearly state exactly how Smith would be modified.

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Applicant submits that Smith discloses electrospinning fibers into a mat or membrane and crosslinking, to provide a **fabric** (see, for example, page 1, last full paragraph). The only opportunity for coating Smith's fibers would be after the spinning process. However, **any attempt to coat Smith's fibers or fabric with a silica coating would clearly render Smith's fabric unsatisfactory for its intended purpose.**

First of all, Smith's invention relies on the fibers having numerous secondary amine sites available for nucleophilic decomposition of the chemical warfare agents, and a coating of silica would almost certainly block access of the agent to the fibers. That is, if coated with silica, Smith's fibers could no longer decompose the chemical warfare agents.

Secondly, Smith's invention is intended to be a fabric worn by a person, and must be "lightweight, breathable fabric, compatible with existing fabrics and permeable to both air and water vapor ..." A fabric coated with silica would almost certainly not have these characteristics.

Therefore, any attempt to coat Smith's fabric with silica would lead to a product that would not function for Smith's purpose. Applicant notes that MPEP 2143.01(V) states:

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)

Therefore, on the basis of *In re Gordon*, there can be no motivation for such a modification of Smith.

Moreover, Sakai et al. generally discloses crosslinked resin-coated silica fine particles (see title, abstract, column 1, line 6, etc.). The Examiner cites the use of a vinyl-containing silane

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coupling agent with a polyethyleneimine dispersant. However, the vinyl-containing silane coupling agent in Sakai et al. is used **to coat a resin onto silica fine particles**. See column 5, lines 27 and ff.:

“In the crosslinked resin-coated silica fine particles of the present invention, the crosslinked resin coating constitutes an outermost layer formed on each calcined silica fine particle **through the vinyl-containing silane coupling agent**.” (emphasis added)

Specifically, Sakai describes “surface-treating calcined fine particles with a vinyl-containing silane coupling agent to introduce vinyl groups onto a surface of each silica fine particle” (column 4, lines 26-29). The surface-treated silica fine particles are then mixed with monomers having a vinyl group to polymerize them (see column 4, lines 30-37). That is, in Sakai, the silica is used as a core and the polymer layer is the outer layer formed on the core.

Therefore, the vinyl-containing silane coupling agent is **not used to form a silica coating** in Sakai et al. The reference **starts with the silica fine particles, and then coats them with resin**. There is **no suggestion in Sakai to coat any polymer with silica**. It is not even possible to combine Sakai with Smith in the manner proposed by the Examiner.

The Examiner cites the use of polyethyleneimine as a dispersion stabilizer in Sakai. However, no polyethyleneimine is included in the Sakai’s resin-coated silica fine particles.

Therefore, there is no suggestion or motivation in Sakai for the structure recited in the present claims.

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The pending claims are therefore not obvious over Smith WO 01/27368 and Sakai et al. (US 5,750,258), taken separately or in combination.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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